Information Disclosure Statement

Applicant respectfully renews the request that each item cited in the Information Disclosure Statement (IDS) of March 26, 2002, be considered in the examination of the present application. Applicant notes that, under 37 C.F.R. § 1.98(a)(1), an IDS may include "patents, publications, applications, or **other information** submitted for consideration by the Office ..." [*Emphasis added.*] Assuming *arguendo* that the downloaded items do not meet the definition of a publication, the rule provides that they can nevertheless be considered as "other information." The only requirement appearing in 37 C.F.R. § 1.98 for "other information" is that a legible copy must be submitted with the IDS. This Applicant has done. The Examiner's consideration of the downloaded items is therefore earnestly solicited.

In this connection, Applicant would not object if the consideration of the "other information" were recorded in an Official Action rather than a Form PTO-1449. Similarly, Applicant would not object if the Examiner chose not to list the "other information" on the face of any patent that might issue based on the present application, so long as the record reflects that this information was considered by the Examiner.

Rejections under 35 U.S.C. § 112

First, claims 1 through 20 stand rejected under 35 U.SC. § 112, first paragraph, as allegedly relying on functional language at the point of novelty. Applicant respectfully traverses this rejection. The functional terms cited in the Office Action are descriptive of chemical compounds. Applicant does not maintain, however, that each individual chemical compound recited in the claims is novel. Rather, the present claims are directed to a novel method. The method has been described precisely, in non-functional language, as "comprising the step of orally administering..." Thus, Applicant respectfully submits that functional language has not been used at the point of novelty in the pending claims.

Applicant also respectfully submits that the claims are in compliance with the enablement requirement of 35 U.S.C. § 112, first paragraph, because those of skill in the art are able to use the claimed method without undue experimentation based on the information provided by the specification in light of the prior art. *See* M.P.E.P. § 2164.01. *See also* the discussion of the definiteness requirement of 35 U.S.C. § 112,

second paragraph, *below*, which also demonstrates that those of skill in the art are readily able to ascertain which chemical compounds are suitable for use in the method of the present invention.

Further, it is well-established that functional language may be used to describe and claim a component of a composition. In fact, the M.P.E.P. at § 2173(g) sets forth the following example of functional language that has been used appropriately in a similar context:

> It was held that the limitation used to define a radical on a chemical compound as "incapable of forming a dye with said oxidizing developing agent" although functional, was perfectly acceptable because it set definite boundaries on the patent protection sought. [*Citation omitted.*]

Applicant respectfully submits that the language describing the compounds used in the methods of the present claims is substantially parallel to this example from the M.P.E.P. Thus, the claims are in full compliance with the requirements of 35 U.S.C. § 112, second paragraph, as well. Accordingly, Applicant respectfully requests that the rejection for allegedly inappropriate use of functional language be withdrawn upon reconsideration.

Second, claims 1 through 20 have been rejected under 35 U.SC. § 112, first paragraph, as allegedly lacking enablement, due to the inclusion of the term "prevention." Applicant believes that the claims are in full compliance with the enablement requirement of 35 U.SC. § 112, first paragraph. Nevertheless, in order to further prosecution of the present application, Applicant has amended claim 1 herein to remove the term "prevention." Therefore, Applicant respectfully requests that this rejection be withdrawn upon reconsideration.

Finally, claims 1 through 20 have been rejected under 35 U.SC. § 112, second paragraph, as allegedly indefinite, due to the inclusion of the terms "one or more compounds effective to regulate at least one of cell differentiation and cell proliferation," "one or more antioxidants," "structurally similar derivatives thereof which exhibit antioxidant activity," "one or more antioxidant enzymes," "anti-inflammatories," "selenium compounds," "non-USP hydrophilic [ointment base]," and "substantially." As stated in the M.P.E.P. at § 2173.02,

> The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:
>
> (A) The content of the particular application disclosure;
>
> (B) The teachings of the prior art; and
>
> (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Applicant respectfully submits that the terms upon which this rejection is based are well known in the art, or else defined explicitly in the specification, such that the metes and bounds of the claims are clear to those of skill in the art.

For example, an extensive discussion of "compounds effective to regulate at least one of cell differentiation and cell proliferation" can be found in the specification at pages 4 through 7, and more particularly on page 4 at lines 14 to 22.

In addition, assay kits for determining whether a particular compound inhibits cell differentiation and/or cell proliferation are commercially available. The University of Massachusetts is offering a license for its method of screening for cancer drugs and other drugs that inhibit or promote cell growth, cell death or cell differentiation for diseases involving Erb action. *See* the webpage printout enclosed herewith having a URL of http://atlas.pharmalicensing.com/licensing/displicopp/548. Furthermore, DiscoveRx Corporation of Fremont, CA markets a Hithunter™ tyrosine kinase assay to detect inhibitors of tyrosine kinase and tyrosine phosphatase, which control or regulate cellular growth, proliferation and differentiation using ß-galactosidase EFC activity. *See* the attached article from DiscoveRx Corporation discussing the method of detecting compounds that control or regulate cellular growth, proliferation and differentiation. Thus, those of skill in the art are possessed of simple means to determine with reasonable certainty whether any given compound is within the scope of Applicant's claims.

The term "anti-oxidant" is included in Merriam-Webster's 10th Collegiate Dictionary, and the definition "a substance that inhibits oxidation or reactions promoted

by oxygen or peroxides" is reported at **www.m-w.com**, the Merriam-Webster web site. Those of skill in the art are well aware of how to determine whether or not a compound has antioxidant properties.

The term "structurally similar derivatives thereof which exhibit antioxidant activity" is defined in the specification on page 7 at lines 28 to 32. "Antioxidant enzymes" are described at length in the specification on page 8 at lines 1 through 10. Again, antioxidant activity, or the absence thereof, is readily ascertainable by one of skill in the art.

The term "anti-inflammatory" is also included in Merriam Webster's 10th Collegiate Dictionary, and is reported at the web site **www.m-w.com** as "counteracting inflammation." A corresponding noun form is noted at the same web site. Those of skill in the art will easily determine whether a given compound has anti-inflammatory properties.

Applicant respectfully submits that those of skill in the art clearly understand the term "selenium compounds." In the interest of furthering prosecution, however, claim 10 has been amended to replace the term "selenium compounds" with the term "compounds containing selenium." Applicant believes that this amendment further clarifies the scope of claim 10. A basis for this amendment may be found in the specification on page 12 at lines 5 to 17, for example. Accordingly, it is not believed that new matter will be introduced into the application as a result of this amendment.

Applicant also respectfully submits that the term "non-USP hydrophilic ointment base" is well known to those of skill in the art. Nevertheless, in order to further the prosecution and improve the clarity of the claims, Applicant has amended claim 17 to delete the term "non-USP." Hydrophilic ointment bases are commercially available and are described in the specification on page 21 at lines 3 to 11, for example. Thus, this amendment has a basis in the disclosure as originally filed, and is, accordingly, not believed to introduce new matter into the application.

Last, Applicant respectfully submits that the word "substantially" is a common term well understood by those of skill in the art. Nevertheless, in order to advance the present prosecution and further clarify the scope of the claims, Applicant has amended claim 17 to delete this term.

Accordingly, Applicant respectfully requests that the rejection for alleged lack of definiteness be withdrawn upon reconsideration.

Rejection under 35 U.S.C. § 103

Claims 1 through 20 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent No. 6,162,801, issued to Kita (hereinafter "Kita"), Bissett, D.L. *et al.*, *J. Soc. Cosmet. Chem.* **1992**, *43*, 85-92 (hereinafter "Bissett"), and Darr, D. *et al.*, *British Journal of Dermatology* **1992**, *127*, 247-253 (hereinafter "Darr"), in view of Shimoi, K., *et al.*, *Mutation Research* **1996**, *350*, 153-161 (hereinafter "Shimoi", of which a complete copy is submitted herewith) and U.S. Patent No. 5,776,460, issued to Kim et al. (hereinafter "Kim"). Applicant respectfully traverses this rejection for the reasons set forth below.

Applicant respectfully submits that the Official Action does not set forth a *prima facie* case of obviousness in support of the rejection under 35 U.S.C. § 103(a). According to M.P.E.P. § 2143,

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.
>
> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. [*Citation omitted.*]

The Official Action cites only one reference, Kita, that sets forth the use of D vitamins to prevent or treat UV-induced damage to the eyes or skin. Kita, however, sets forth the **topical** use of D vitamins, and states that the D vitamins function as a sunscreen. That is, according to Kita, an external layer of vitamin D will protect the eyes or the skin against UV-induced damage at least in part by absorbing the UV radiation before it

reaches the body. *See* Kita at col. 4, ll. 40-44, and at col. 6 ll. 17-20, *inter alia*. Any compound with an appropriate absorption spectrum, *e.g.*, any sunscreen, will serve this purpose.

By contrast, Applicant's claimed invention is a method of treating or reducing radiation injury by **orally** administering a composition comprising one or more compounds effective to regulate at least one of cell differentiation and cell proliferation, for example, a D vitamin, and one or more antioxidants.

Applicant respectfully submits that Kita does not include Applicant's claimed limitation that the composition comprising one or more compounds effective to regulate at least one of cell differentiation and cell proliferation, *e.g.*, a D vitamin, be administered **orally**. Moreover, there is no teaching or suggestion in Kita to combine a D vitamin with an antioxidant of any type. Finally, Applicant respectfully submits that Kita cannot provide a reasonable expectation of success for the claimed invention, because there is no reason why a topical treatment for UV-induced damage should predict the success of an oral treatment that is useful for internal and external injuries resulting from ionizing radiation. *See* the specification on page 3 at lines 7 to 23.

The remaining references cited in the Official Action, that is, Bissett, Darr, Shimoi, and Kim, include descriptions of the use of various antioxidants, or an antioxidant in conjunction with an anti-inflammatory, to treat radiation-induced damage. None of the cited references, however, includes any teaching or suggestion to combine the antioxidants with a compound effective to regulate at least one of cell differentiation and cell proliferation. Of secondary importance, none of these references includes any teaching or suggestion regarding the D vitamins, or oral administration of the D vitamins.

In summary, Kita contains no teaching or suggestion regarding antioxidants. Nor does Kita contain any teaching or suggestion regarding the oral administration of D vitamins or any other compound effective to regulate at least one of cell differentiation and cell proliferation. The Bissett, Darr, Shimoi, and Kim references contain no teaching or suggestion regarding D vitamins, or other compounds effective to regulate at least one of cell differentiation and cell proliferation. Nor do they contain any teaching or suggestion regarding the oral administration of such compounds. Applicant therefore respectfully submits that the cited references do not contain every element of Applicant's

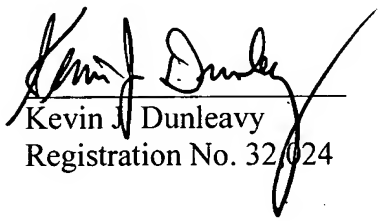
claimed invention, and also do not contain any teaching or suggestion to make Applicant's claimed invention. Accordingly, Applicant also respectfully submits that the Official Action does not set forth a *prima facie* case for the obviousness of claim 1 over the cited references.

All of the dependent claims currently pending in the present application ultimately depend from independent claim 1. Applicant respectfully submits that, because independent claim 1 is not obvious over the cited references, dependent claims 2 through 20 are also not obvious. Accordingly, Applicant respectfully requests that the rejection under 35 U.S.C. § 103(a) be withdrawn upon reconsideration.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully submits that all of the pending claims are in condition for allowance and respectfully requests a favorable Office Action so indicating.

Respectfully submitted,



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Dated: January 2, 2003

Enclosures: Full text of Shimoi, K., *et al.*, *Mutation Research* **1996**, *350*, 153-161.
Web page printout
DiscoveRx article

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APPENDIX: CLAIMS AS AMENDED, WITH REVISIONS MARKED

1. (Amended). A method for the ~~prevention,~~ reduction or treatment of radiation injury comprising the step of orally administering to a human prior to expected exposure to radiation, during exposure to radiation or after exposure to radiation, a composition which comprises an amount of one or more compounds effective to regulate at least one of cell differentiation and cell proliferation which is effective, when administered orally, to regulate at least one of cell differentiation and cell proliferation, and an effective amount of one or more antioxidants.

10. (Amended) A method as claimed in claim 1, wherein the composition further comprises one or more ingredients selected from the group consisting of selenium and ~~selenium~~ compounds containing selenium.

17. (Amended) A method as claimed in claim 16, wherein the pharmaceutically acceptable topical carrier comprises a sufficient amount of at least one ~~non-U.S.P.~~ hydrophilic ointment base to form a ~~substantially~~ topical composition.